

### **REMARKS**

Claims 17-24 and 26 are rejected. Claims 1-16 are withdrawn from consideration. Claims 25 and 27 are objected to. Claims 17 and 21 have been amended. Claim 20 has been canceled. Claims 17-19, 21-27 are presently pending in the application. Favorable reconsideration of the application in view of the following remarks is respectfully requested.

The basis for the amendment of claim 17 is found in claim 20 as originally filed. The basis for the amendment of claim 21 is found in claims 20 and 17 as originally filed.

#### **Double Patenting and Rejection Of Claims 17-24 and 26 Under 35 U.S.C.**

##### **§103(a):**

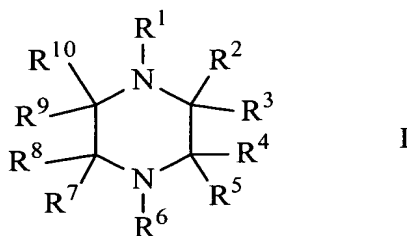
The Examiner has rejected Claims 17-24 and 26 are rejected on the ground of nonstatutory obviousness type double patenting as being unpatentable over claims 1-23 of U.S. Patent No. 6,815,078 in view of Lazzari et al. U.S. Patent 6,642,383, indicating that, although the conflicting claims are not identical, they are not patentably distinct from each other because claims 1-23 of 6,815,078 disclose a gelatin based substrate having at least one surface, a polymer scaffold affixed to the gelatin surface; and a trifunctional compound A-L-B. A polymer forming the polymer scaffold is polyvinylamine or polypropyleneimine, or poly(N-aminopropyl methacrylamide) or poly(n-vinylimidazole), and a trifunctional compound A-L-B is readable for being a crosslinking compound in the present claims, wherein A is a functional group capable of interacting with the polymer scaffold. 5. The Examiner indicates that the difference between the present claims and claims 1-23 of Patent '078 is the requirement in the present claims of a plurality of piperazine functional groups containing polymer wherein said piperazine functional group are capable of interacting with a functional group of A of said crosslinking compound A-L-B, wherein said polymer having a plurality of piperazine functional group is attached to the surface of the claimed element, but Lazzari discloses a compound of formula I suitable for grafting and carrying an ethylenic double bond and having piperazine moiety, which compound can be used as a stabilizer for natural polymers including gelatin, making it obvious to one of ordinary skill in the art to substitute a polymer scaffold having amino moieties in the gelatin-based substrate in claims 1-23 of Patent '078 with a polymer having piperazine moiety in Lazzari invention for the

purposes to increase stability of the gelatin and because both amino group and piperazine group have the same covalent linkage with a functional group of A in the crosslinking compound.

Qiao discloses a gelatin-based substrate for fabricating protein arrays, the substrate comprising gelatin having at least one surface, a polymer scaffold affixed to the gelatin surface, wherein the polymer in the scaffold is rich in reactive units capable of immobilizing proteins. As noted by the Examiner, the reference fails to disclose polymers having a plurality of piperazine functional groups.

Lazzari discloses compounds of the class 3,3,5,5-tetramethyl-2-oxo-1,4-piperazine, polymers thereof, and their use as stabilizers against harmful effects of light, oxygen and/or heat, and organic material stabilized correspondingly, which are effective stabilizers for organic materials, for example, thermoplastic organic polymers, coating compositions or photographic materials.

The present invention relates to protein arrays, the element comprising a surface to which are attached a plurality of piperazine functional groups; a polymer; a crosslinking compound A-L-B; wherein A is a functional group capable of interacting with a piperazine functional group of the invention; L is a linking group capable of interacting with A and with B; and B is a specific functionality that provides one or more reactive units capable of interacting with a protein capture agent, and wherein the piperazine functional groups are represented by Formula I:



where

R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, are hydrogen, alkyl, alkenyl, alkynyl, alkylhalo, cycloalkyl, cycloalkenyl, alkylthio, alkoxy, with the proviso that at least one of the groups R1 to R10 be a linkage group (L').

To establish a prima facie case of obviousness requires, first, there must be some suggestion or motivation, either in the references themselves, or in

the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art references (or references when combines) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in the applicant's disclosure. *In re Rouffet*, 149 F.3d 1350, 1357, 47 USPQ2d 1453, 1457-58 (Fed. Cir. 1998).

As noted by the Examiner, Qiao fail to mention motivation polymers having a plurality of piperazine functional groups. Lazzari discloses compounds of a class of oxo-piperazines, but fails to disclose a piperazine of Formula I, which formula specifically excludes oxo-piperazines. The Examiner indicates that the necessary motivation is that a polymer having amino moiety can be substituted with a polymer having piperazine moiety, this being within the skill of a worker in the art to provide desired stability of the gelatin coating on the surface and since both these functional moieties work within the same covalent linkage with other functional groups. However, there is no motivation to utilize only those piperazine materials of Formula 1, which exclude oxo-piperazines.

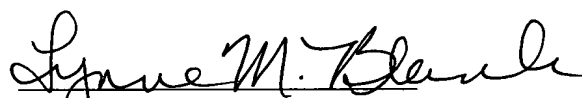
The references also fail to provide any likelihood of success. There is no teaching in either reference to indicate that the functional moieties of Formula I would provide the combination of high reactivity and selectivity of the piperazine functional groups of the invention towards certain crosslinkers as compared to other amines and nitrogen-containing compounds, as well as freedom from undesirable side reactions, since Qiao is silent in regard to piperazine and Lazzari discloses oxo-piperazines. There are a very large number of compounds and methods known to those skilled in the art which may be utilized to attach to a surface and attached to a crosslinking compound, which is, in turn, capable of interacting with a protein capture agent. There are, further, a tremendous number of types of piperazines. Protein array systems are very complex and unpredictable and the fact that two technologies are independently successful, one in array systems, and the other as a polymer stabilizer, does not indicate that the combination will be useful or beneficial in the present usage. Therefore, there is no reasonable expectation of success found in any combination of the cited references.

Neither reference provides all the limitations of the present claims. Qiao fails to disclose polymers having a plurality of piperazine functional groups and Lazzari discloses oxo-piperazines. Neither reference discloses piperazine functional groups of Formula I.

Therefore, since the references, alone or in combination, fail to suggest or motivate one of ordinary skill in the art to modify the reference or to combine reference teachings, fail to provide a reasonable expectation of success, and fail to teach or suggest all the claim limitations, the Applicants request that the Examiner reconsider and withdraw the rejections based on double patenting and under 35 U.S.C. §103(a):

It is believed that the foregoing is a complete response to the Office Action and that the claims are in condition for allowance. Favorable reconsideration and early passage to issue is therefore earnestly solicited.

Respectfully submitted,

  
Attorney for Applicant(s)  
Registration No. 42,334

Lynne M. Blank/ct  
Rochester, NY 14650  
Telephone: 585-477-7418  
Facsimile: 585-477-1148

If the Examiner is unable to reach the Applicant(s) Attorney at the telephone number provided, the Examiner is requested to communicate with Eastman Kodak Company Patent Operations at (585) 477-4656.